

5. The apparatus of Claim 1, wherein the blood property change port and the sensor are spaced by a sufficient distance to substantially mix a dilution indicator introduced through the port and the blood flow.

6. The apparatus of Claim 1, wherein the blood property change port includes one of a heat sink and a heat source for creating a local temperature gradient.

7. The apparatus of Claim 1, wherein the signal from the sensor corresponds to a blood flow in the vessel.

8. The apparatus of Claim 7, wherein the correspondence relates blood flow to $\frac{V}{\int C(t)dt}$ where V is the volume of indicator introduced and $\int C(t)dt$ is an area under a dilution curve.

9. (Once Amended) A stenosis reducing catheter, comprising:

(a) a stenosis reducing member selectively actuatable to reduce stenosis in a vessel;

(b) a port for inducing a blood property change to blood flowing external to the stenosis reducing catheter; and

(c) a sensor spaced from the blood property change port for providing a signal corresponding to a change in a blood property external to the stenosis reducing catheter.

10. The catheter of Claim 9, wherein one of the sensor and the catheter is configured to locate the sensor with respect to the vessel to minimize wall effects.

11. The catheter of Claim 9, further comprising a controller operably connected to the sensor to calculate a flow rate corresponding to the signal from the downstream sensor.

12. The catheter of Claim 9, wherein the port includes an aperture for introducing a blood property variant.

13. The catheter of Claim 9, wherein the blood property change port and the sensor are spaced by a sufficient distance to substantially mix a dilution indicator introduced through the port and the blood flow.

14. The catheter of Claim 9, wherein the port includes one of a heat sink and a heat source for creating a local temperature gradient.

15. (Twice Amended) An apparatus for determining blood flow, comprising:

(a) a dilution indicator source;

(b) a catheter connectable to the dilution indicator source, the catheter having means for performing a vascular corrective procedure, a dilution indicator port for passing a dilution indicator therethrough to pass from the catheter and a downstream sensor for producing a signal corresponding to passage of the dilution indicator external to the catheter; and

(c) a controller connected to the dilution indicator source and the sensor for calculating a blood flow in response to the signal from the sensor.

32 sub C6 16. (Twice Amended) A method for quantitatively measuring a reduced stenosis induced flow change, comprising:

(a) inserting a catheter and a blood property sensor into a vessel having a blood flow corresponding to the stenosis;

(b) introducing a first change in a blood property in a blood flow outside the catheter and upstream of the blood property sensor;

(c) detecting passage of the first change in the blood property at the blood property sensor;

(d) reducing the stenosis of in the vessel;

(e) introducing a second change in the blood property upstream of the sensor;

(f) detecting passage of the second change in the blood property at the blood property sensor; and

(g) determining a change in blood flow corresponding to the detected passage of the first change in the blood property and the second change in the blood property.

17. The method of Claim 16, wherein inserting a catheter and a blood property sensor into a vessel includes inserting a first catheter having a stenosis reducing member and a second catheter having the blood property sensor.

18. The method of Claim 16, wherein inserting a catheter and a blood property sensor into a vessel includes inserting a catheter having a stenosis reducing member and the blood property sensor.

19. (Twice Amended) A method of monitoring blood flow during a vascular corrective procedure, comprising:

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- (a) inserting a catheter into a vessel;
 - (b) employing the catheter to perform a vascular correction in the vessel;
 - (c) introducing a first blood property change into a blood flow outside the catheter;
 - (d) detecting passage of the first blood property change past a downstream sensor on the catheter; and
 - (e) calculating the blood flow in response to the change in blood property and passage of the blood property past the downstream sensor.

20. (Twice Amended) An apparatus for determining blood flow in a vascular passage, comprising:

- (a) a catheter having means for increasing the effective size of a portion of the vascular passage, the catheter including a dilution indicator introduction port located to pass a dilution indicator from the catheter and a downstream blood property sensor; and
- (b) a controller operably connected to the blood property sensor for calculating a flow through the vascular passage corresponding to a signal from the blood property sensor.

21. The apparatus of Claim 20, wherein the controller determines the flow corresponding to the relation $AF = \frac{V}{\int C(t)dt}$ where AF corresponds to the flow, V is a volume of indicator introduced and $\int C(t)dt$ is the area under a dilution curve.

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22. (Once Amended) An apparatus for determining an intra-procedural blood flow in a corrective procedure, comprising:

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- (a) a catheter;
 - (b) a blood parameter altering section on the catheter located to alter a blood parameter external to the catheter;
 - (c) means for effecting the corrective produce; and
 - (d) a blood parameter sensor connected to the catheter and spaced from the blood parameter altering section to sense the altered blood parameter external to the catheter.

23. The apparatus of Claim 22, wherein the blood altering section includes one of a port and a temperature gradient generator.

24. The apparatus of Claim 22, further comprising a controller connectable to the altering section and the blood parameter sensor to calculate the blood flow.

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25. (Once Amended) A method of monitoring a stenosis reducing procedure in a vessel, comprising:

- B5
- (a) locating a blood parameter altering section in the vessel to alter a blood parameter in a blood flow contacting the vessel;
 - (b) locating a blood parameter sensor downstream of the altering section;
 - (c) performing the stenosis reducing procedure; and
 - (d) determining a blood flow in response to a passage of an altered blood property past the blood parameter sensor.

26. The method of Claim 25, wherein performing the stenosis reducing procedure includes angioplasty.

27. The method of Claim 25, further comprising locating the blood parameter sensor to reduce wall effects from the vessel.

28. The method of Claim 25, further comprising rotating the blood parameter sensor with respect to the vessel to reduce wall effects from the vessel.

29. The method of Claim 25, further comprising locating a plurality of blood parameter sensors in the vessel.

30. The apparatus of Claim 1, wherein the sensor detects changes in one of electrical impedance and electrical resistance.

31. The apparatus of Claim 1, wherein the sensor detects one of an optical, thermal, electrical, chemical or physical property of the blood.

32. The catheter of Claim 9, wherein the sensor detects changes in one of electrical impedance and electrical resistance.

33. The catheter of Claim 9, wherein the sensor detects one of an optical, thermal, electrical, chemical or physical property of the blood.

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C10 34. (New) An apparatus for determining a blood flow in a vessel, comprising:

B6 (a) an elongate catheter having a stenosis reducing member, a blood property change port located to alter a blood property outside the catheter and a downstream sensor spaced from the port for producing a signal corresponding to the blood property in a blood flow in the vessel, and the correspondence relates blood flow to $= \frac{V}{\int C(t)dt}$ where V is the volume of indicator introduced and $\int C(t)dt$ is an area under a dilution curve..

35. (New) An apparatus for determining blood flow in a vascular passage, comprising:

(a) a catheter having means for increasing the effective size of a portion of the vascular passage, the catheter including a dilution indicator introduction port and a downstream blood property sensor; and

(b) a controller operably connected to the blood property sensor for calculating a blood flow through the vascular passage corresponding to a signal from the blood property sensor and corresponding to the relation

$AF = \frac{V}{\int C(t)dt}$ where AF corresponds to the blood flow, V is a volume of indicator introduced and $\int C(t)dt$ is the area under a dilution curve..